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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/526,145	10/14/2005	Sunil C. Shah	VOY-038US	2524

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WOOD, HERRON & EVANS, LLP (TOKYO ELECTRON)  
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CINCINNATI, OH 45202

EXAMINER
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BARON, HENRY

ART UNIT	PAPER NUMBER
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2616

NOTIFICATION DATE	DELIVERY MODE
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08/21/2008

ELECTRONIC

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

dgoodman@whepatent.com  
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<b>Office Action Summary</b>	<b>Application No.</b> 10/526,145	<b>Applicant(s)</b> SHAH ET AL.	
	<b>Examiner</b> HENRY BARON	<b>Art Unit</b> 2616	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 28 February 2005.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 28 February 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)            | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date. _____                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>6/15/2007, 2/27/2006</u> .                                    | 6) <input type="checkbox"/> Other: _____                          |

## ***DETAILED ACTIONS***

### **METHOD AND SYSTEM FOR SPLIT-PAIR RECEPTION IN TWISTED-PAIR COMMUNICATION SYSTEMS**

#### ***Claim Rejections - 35 USC § 103***

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness

rejections set forth in this Office action:

a. A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1 is rejected under 35 U.S.C. 103(a) as being unpatentable over Cioffi, et al (U.S. Patent 5887032), hereafter Cioffi, in view of in view of Ginis et al (U.S. Patent 7158563) hereafter Ginis.

3. In consideration of claim 1, Cioffi teaches a method for reducing signal distortion in a multiple line transmission system, the method comprising: using one or more split-pair receivers in a multilinear communications system to identify crosstalk on a pair of transceivers coupled to the split pair receivers, (3: [0044] read [a]s a crosstalk interference canceller for mitigating crosstalk interference induced by signals on a first line onto signals on a second line, .. an adaptive filter i.e. split pair receiver, for producing a crosstalk cancellation signal based on estimated coupling coefficients between the first line and the second line at predetermined frequencies and based on signals on the first line at the predetermined frequencies; ) where each split pair receiver receives a signal including the crosstalk from each transceiver (2: [0012] read the processing i.e. a post processing unit, and distribution unit 104 services a multiplicity of discrete subscriber lines 112-1 through 112-n. Each subscriber line 112 typically services a single end user.) and provides a corresponding signal vector to a post processing unit; (3: [0044] read .. a subtractor for subtracting the crosstalk cancellation signal from the signals on the second line to produce a modified signal on the second line i.e. provides a corresponding signal vector to a post

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processing unit, the modified signal thereby having any crosstalk interference from the first line mitigated)

4. However, Cioffi does not disclose performing MIMO post-processing on signal vectors received at a receiver from each transceiver and each split-pair receiver while minimizing crosstalk on pairs of lines in the multiline communications system with a frequency equalizer,

5. Ginis teaches these limitations, in particular performing MIMO post-processing on signal vectors received at a receiver from each transceiver and each split-pair receiver while minimizing crosstalk on pairs of lines in the multiline communications system with a frequency equalizer. (21: [0051] read .. preferred MIMO precoder described above corresponds to a single tone and is shown in FIG. 13.

Combining the precoders of all tones and including the DMT transmitters and receivers, the vectored DMT system for downstream transmission is shown in FIG. 14 i.e. performing MIMO post-processing on signal vectors received at a receiver from each transceiver. )

6. It would have been obvious at the time the invention was made by a person of ordinary skill in the art to modify the signal distortion in a multiple line transmission system teachings of Cioffi with the MIMO post-processing teachings of Ginis.

7. In this manner for a digital communication systems where the transmission medium consists of twisted pairs copper wiring (e.g. Digital Subscriber Line (DSL) systems, ISDN, HDSL, ADSL and VDSL, and Local Area Networks (LAN), such as Ethernet), where cross-talk is prevalent both as near-end crosstalk (NEXT) and far-end crosstalk (FEXT) interference, the spurious signals produced by these signals can be mitigated using a split-pair receiver to increase the dimension of the signal space used advantageously for crosstalk mitigation in the multiline system.

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***Conclusion***

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to HENRY BARON whose telephone number is (571)270-1748. The examiner can normally be reached on 7:30 AM to 5:00 PM E.S.T. Monday to Friday.

9. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Seema Rao can be reached on (571) 272-3174. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

10. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/H. B./  
Examiner, Art Unit 2616  
HB

/Ian N. Moore/  
Primary Examiner, Art Unit 2616